How We Got from There to Here and Back

Aim

Edward H. Angle dominated orthodontic armamentarium, diagnosis and treatment planning for almost a century by extracting teeth prior to orthodontic therapy. Angle had unsuccessful attempts at nonextraction therapy. Angle had unsuccessful attempts at nonextraction therapy.

Introduction

For the first third of this past century, orthodontics found itself dominated by one man, Edward H. Angle, with the resultant intellectual stagnation that arises from such monomaniacal control. This recognition in any scientific discipline more than it helped, and the last half of this past century was spent trying to overcome the stupor of the first half. Angle's influence continued until an insistence upon enlarging the arches to accommodate all of the teeth. This demanded unusual dexterity, patience and/or treatment planning.

Nonextraction Philosophy

Aside from the edgewise bracket and the classification system, Angle's most enduring legacy has been his belief in nonextraction therapy. Angle had unsuccessful attempts at nonextraction therapy. He never solved the problem of parallelism, the brain is not an organ of thinking but an organ of survival like a claw and fang. It is made is such a way as to make us accept as truth that which is only advantage.

From the inception of this specialty, with Dr. Angle, diagnosis never had too much importance because everyone received the same nonextraction treatment with the same expansive appliance. The marvel of it all is that the collection of orthodontic records never became important. A few months ago an orthodontist boasted that since invoking a different treatment regimen, he was treating 98% of his patient's nonextraction. One was tempted to ask if he still took records because with diagnostic certainty such as that, records are clearly redundant. Orthodontists shouldn't waste patients' time and money taking impressions, cephalometric X-rays or doing treatment simulations if all treatment plans are essentially the same. One doesn't need orthodontic records to come to such a preconceived conclusion.

Obviously, this one-size-fits-all treatment planning didn't benefit patients a hundred years ago, and it doesn't in our own age. But such simplicity continues to hold enormous appeal for many orthodontists. Orthodontists pride themselves in being scientists, and without doubt they receive good training in the scientific method; but it takes very little anecdotal information to eclipse the scientific judgment of many in the profession. Albert Szent-Gyorgyi was probably more right than he knew when he said, "The brain is not an organ of thinking but an organ of survival like a claw and fang. It is made in such a way as to make us accept as truth that which is only advantage."

No matter how spectacularly orthodontic therapy changes, it will benefit our patients minimally if we do not have a concomitant improvement in our diagnostic and prognostic knowledge. This remains the number one imperative for those who practice orthodontics. Orthodontists should view any new therapy unaccompanied by equally sophisticated diagnostic knowledge suspiciously. Patients have already received far too much orthodontic therapy and far too little diagnosis.

Instrumentation

The first attempts to correct malocclusions used simple large arch wires ligated to the malposed teeth. Pierre Fauchard of France developed the precursor of the modern appliance – expansion arch (Figure 1).

Figure 1: Fauchard's expansion arch

When Angle launched the ribbon arch bracket, he had already started work on the edgewise bracket primarily as a supplement to his ribbon arch appliance. Nevertheless, the edgewise bracket did not suddenly spring full-grown from Angle's fertile mind, but slowly evolved with several iterations (Figure 5). When Angle realized that this bracket could deliver three-dimensional control of the teeth with horizontal, one directional placement and simultaneous engagement of all the teeth, he changed the bracket several times until he achieved the #447 (Figure 6) in 1928.
from dental clinicians throughout the Unit- ed States and eventually eclipsed other use- ful orthodontic appliances such as the Mc- Coy open tube appliance, the Atkinson uni- versal appliance and the Johnson twin wire attachment.

The universal application and durability of the edgewise bracket confirmed Angle’s modest claim that it offered the “latest and best in orthodontic mechanisms”.11 Innovators have added minor but practical trimmings such as rotating wings, twin brackets, different dimensions, preadjusted appliances, lingual applications, etc., but the essence has remained edgewise. For any instrument, particularly in the health sciences, to remain virtually unchanged (and almost as useful for close to a century) approaches unbelievable. In the auto- mobile industry, this would be equivalent to the Model T Ford remaining as the epitome of motoring sophistication.

Other than adding wings and doubling the bracket to make the popular twin edgewise bracket, Angle’s invention has remained basically unchanged. Holdaway10 suggested angulations for brackets to help set an- chorage, parallel roots and artistically posi- tion teeth, while Lee11 had built some ante- chorage, parallel roots and artistically posi- tioning for brackets to help set an-

High-force titanium coil expanders have shown their ability to develop arches lat- erally,13 and recently Damon14 has suggest- ed that low arch wires, coupled with a passive tube and a small wire-to-lumen ratio, enable teeth and their accompanying dentinal walls to expand in all planes of space. Damon feels that using small, low-force wires such as those of Copper Ni-Ti™ (Ormco Corporation, Orange, CA) achieves the ideal biological forces proposed long ago by several investigators.15,16,17

Self-ligating brackets that essentially form a tube developed several decades ago with the Ormco EdgeloK™ being the first, close- ly followed by the Speed bracket18. Both of these early self-ligating systems suffered from the fact that the Straight-Wire Appar- atus phenomenon debuted at the approxi- mately the same time, plus a lack of appreci- ation for what the newer titanium wires could achieve.

Damon has persisted since 1995 with his version of a self-ligating bracket (Figure 8) and has fundamentally changed the types of arch wires and the sequence in which cli- nicians use them. His experience has shown that with many patients he can often elimi- nate distalisation of molars, extractions (ex- cluding those needed to reduce bimaxillary protrusions) and rapid palatal expansion. He offers compelling clinical evidence of doing this with consistency.19

The Damon bracket is essentially a tube de- signed with the right dimensions to fos- ter sliding mechanics where needed and enough play in the system for torque and rotational control using the larger cross sec- tion wires. Damon starts cases with a large lumen arch wire and with 0.044 or smaller di- ameter hi-technology arch wires. Starting cases with a large dimension passive arch wire slot and small diameter wires dimin- ishes the divergence of the angles of the slots. This lowers the applied force and binding friction. (Figure 7)

The most logical questions readers could propose would be which has Damon shown successful expansion whereas Angle did not? The quantity of expansion probably differs little, but the quality of expansion offers a quantum change. Mollenbauer20 has suggested as much with his appeal for light forces. Even though Angle used a rib- bon arch, (which suggests a thin, delicate wire) the actual size of the wire had the di- mension of 0.06 x 0.02 inches. Ligating to this wire would overwhelm the periodonti- um and prevent the development of a sup- porting dentinal wall. Rather than form- ing new bone, the supporting dentinal wall would simply bend and upon comple- tion of treatment quickly return. Astute cli- nicians often see this with molar distalis- tation from headgear use and over treat such movement in order to compensate for this regressive bone bending.

Schwarte21 stated that it takes 20 to 26 g/ cm² of force to collapse the capillaries in the Periodontal Ligament. With RPEs and headgears this force sometimes exceeds 10 pounds! Profitt22 states that only optimal force lev- els for orthodontic tooth movement should be just high enough to stimulate cellular ac- tivity without completely occluding blood vessels in the periodontal ligament.

True Biomechanics is staying in the Opti- mal Force Zone i.e. keeping forces below capillary blood pressure. Conventional ties (o-rings and stainless steel ligatures and spring clips) make staying in the Optimal Force Zone nearly impossible due to the in- creased binding and friction. The most important caveat Damon offers clinicians is not to use their ordinary me- chanics with his system, and I could not agree more. When I first began to use the Damon system, I continued to use the reg- ular sequence of arch wires and saw little advantage to these new, more expensive brackets. Nevertheless, as I began to use the brackets according to Dr. Damon’s ad- vice, I started seeing phenomenal chang-
The conference itself started on the 19 Feb, with the opening ceremony where Prof Suliman Alomaran, Head of SOS welcomed the distinguished guest, delegates, speaker and society members to this year’s meeting. He also summarized the achievements of the SOS Board through the last 3 years. This year is the last year of the board and handing of responsibility will be given to the newly elected board at the end of the meeting. The opening ceremony was followed by an important lecture titled “Critical evaluation in orthodontic appliance” by Prof. W. Proffit where he gave a summery of his 50 years experience with fixed appliance and what are the changes that the orthodontists could expect in the coming years.

This was followed by an interesting lecture of “Overview of CLII treatment” which was given by Dr. Tamer Buyukylmaz where he presented the clinicly proven technique for treating CLII cased backed by number of cases that he treated himself for ranging from children all the way to adulthood and which technique has shorter time than the other. Since the temporary anchorage device is to get much attention these days, Prof. W. Proffit later on the day presented a lecture on “UNC experience with screw and mini plate”, thus giving the pros and cons of them with keys of success illustrated by multiple cases showing perfect results and decreasing the need for surgical intervention with Orthodontic. The first day was wrapped up by Dr. Robert Boyd lecturing on “Orthodontic and Esthetic consideration in planning and place ment of Restorative Implants” where he stressed on the more demanding of esthet ics by patients since Orthodontic by it self could not fulfill all patient demands such as having a brighter and wider smile, he showed several cases with restorative treatment giving the final touches to a good Orthodontic treatment. He also compared between cases treated by orthodontics alone and one treated by multi approach of Ortho-Resto-Perio which really made a bigger difference in those patients smiles.

On the second day of the conference Prof William Clark who is the inventor and developer of the famous twin block function al appliance which is the most used one to correct CLII skeletal discrepancy in growing individuals. In his lecture Prof Clark took the audience through the different steps of diagnosis and treatment utilizing twin blocks with minimal and/or no need for fixed appliance. He stressed the importance of patient selection, motivation and instruction to the success of treatment with such devices. The audience interacted with this lecture since some of them had there doubts about this method but Prof Clark explained to them the keys for success using this method. Dr. Robert Boyd concluded the morning session with a talk on “How can aligners be used for complex Orthodontic cases” ranging from extraction cases to correcting of much hard vertical cases in adults with good prognosis and lasting stability. The afternoon session was dedicated to future promising subjects in Orthodontics such as distraction cheliplasty where Dr. Abdullah Alfaidi spoke from his surgical background as a Craniofacial Surgeon how this minimal procedure could improve the smile dramatically without the need to more complex Orthognathic surgery involving cutting of bone or augmentation. The audience listened with attention on how to select cases for such a procedure and how the procedure is done in a very short time under one hour in some cases. Later that day Dr. Sarah Allaqah spoke on “Constraints on tooth growth by developing alveolar bone” where she pointed the causes of such problem, which used to be thought that the main cause behind it is primary teeth. Then Dr. Hadwah Moawad took the stage to speak on “Genetic in Orthodontic” and how the advancement in this field could lead to prediction and reducing malocclusion.

The 2nd day of the conference concluded by a lecture Given by Prof Clark where he spoke on “New horizons in Orthodontic and Dentofacial Orthopedics”, he highlighted the latest development in Orthodontic thus his talk raised lots of questions from the audience about the technique presented and how to use them for the best benefit for the patient and practitioner. This led to the time scheduled for the lecture to extend to more than ½ hour then the scheduled time. The conference was followed by a post conference with the title of “The Forces System: Advance in fixed appliance tech nique. New technique for lingual arch developing” where Prof Clark spoke for over 6 hours over the whole day on his new invention Forces System which make correcting transverse problems and CLIII easier through utilizing the lingual arch developing technique which gives faster and more repayable results as was explain by Prof Clark in comprising to fixed appliances placed from the buccal side. Accompanying the 7th conference was an exhibition dedicated for Orthodontic products and new advancements in this field with over 14 local and international companies which captured the interest of all 500 participants who attended the conference. Overall the 7th Saudi Orthodontic conference was up to the level of expectation and gain satisfac tion on venue, speakers, and overall organization which showed clearly from the feedback of the attendees. With warm smiles the participants said farewell to each other hoping to see one another around the same time next year at the 2014 annual meeting.

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I am constantly striving to implement the critical initiatives required to meet and exceed my reader’s expectations. Linked with my burning desire to be influential in introducing scientific excellence embodied in a prominent professor who is aiming to create a supportive and stimulating environment that will fuel my interest. I have the honor to introduce with grace and respect Prof. Dr. Abbas Zaher, a celebrity who is accustomed to worldwide attention. I will definitely focus in my valuable interview on the professional artist who with his tremendous knowledge and vast experience is well known for creating natural and flawless smiles on peoples faces after reshaping their dental flaws bringing the highest standards of performance and outcomes thus setting an unrepeatable example for his colleagues from almost every corner of the world. This also was an opportunity to extend help and assistance in the formation of first time specialty organization in many parts of the world. Now, I have traveled to all continents and a major part of the globe. I can say that I have developed friendships in almost every corner of the world. And that is the most benefit I received from my service on the WFO board for 10 years and I treasure it tremendously.

Please identify your goals and ambitions for the next 2 years and your plans to achieve them and cultivate your profound knowledge in implementing them.

My goals for the Egyptian Orthodontic Society include; establishing the already agreed upon Egyptian Board of Orthodontists, in addition, to devise an awareness plan for the general public about the benefits of orthodontic treatment and the training and studies in order to become specialized in orthodontics. These two ambitious goals maintain the assistance of your members and large amount of funds.

There are conflicting studies that were rarely clear-cut, would you like to talk about any of them?

What contemporary scientific issue are you most concerned about now?

I am most concerned with scientific research that will directly apply to our clinical function, health and longevity of the dentition as being vice president of the World Federation of Orthodontists; the international organization of the specialty in our country. My strength in orthodontics lies in being a leader and looking after the specialty of Orthodontics with great passion.

I am always trying to approach my mission as a professional leader in orthodontics and in strenuous work for the development of our specialty. It was most enriching experience. Besides being involved in the governance of one of the largest specialty organizations, I had the privilege of being associated with a board of trustees made of a dedicated and talented group of individuals. Each and all of them had an impact on my professional development. It was an opportunity to join in the establishment of two very important documents by the World Federation of Orthodontists; the international board of orthodontics and the guidelines for orthodontic education. In addition, I had the chance to meet world renowned international colleagues from almost every corner of the world.

Would you talk to us about your experience as being vice president of the World Federation of Orthodontists?

It would be highly appreciated if you give us a piece of advice for a student considering to shape his or her future with a career in orthodontics.

First do not consider malocclusions as the problem. Malocclusions happen to be attached to a person’s mouth. These persons are seeking your help to improve their smiles, looks and self-esteem. My first advice is to handle every individual case.

The classifications are designed to facilitate communications with colleagues but are never the basis for your protocol or treatment. There are no two alike. Measurements and cephalometrics analysis give you an idea about the extent and position of the problem. Do not attempt to treat patients to cephalometrics “norms” or averages. Tailor the treatment plan according to individual and consider the aid from other specialists as needed. Always relate your ideas to your patients before the start of the treatment and do not surprise them with the need for adjunctive procedures at the end of treatment.

You are a well-known entity in the orthodontic science, how much of you are there in this field?

My patients are occupying a large part of my professional life, after that, I can easily say that in the field of orthodontics I am divided between Scientific research and teaching, and looking after the specialty in Egypt and at the international level. I enjoy teaching to graduate students and conducting research that attack clinical problems. In this respect, I also enjoy listening and lecturing about evidence-based clinical knowledge.

In what way your fruitful knowledge and rich experience will assist you in handling your responsibilities in the Egyptian Orthodontic Society? It would be appropriate if you inform us on what your work revolves around in this organization.

Travelling around the world whether to attend conferences or to lecture gave me great opportunities to interact with colleagues from various backgrounds. Also participating in the organization of several international scientific events which is helping put, the society at the international levels. In addition, personally knowing the renowned international speakers facilitates the organization of scientific meetings for the society and inviting excellent speakers. I was elected to serve on the board of directors of the World Federation of Orthodontists for ten years and from 2010 to 2011 I served as Vice President of the WFO. During those years I gained experience in the governance of a national association, which also help in the organization of the specialty in our country. We are currently building the Egyptian Orthodontic Society board of directors (the board of orthodontics and the guidelines of Orthodontists; the international organization of Orthodontists) in Egypt. My patients are occupying a large part of my professional life, after that, I can easily say that in the field of orthodontics I am divided between Scientific research and teaching, and looking after the specialty in Egypt and at the international level. I enjoy teaching to graduate students and conducting research that attack clinical problems. In this respect, I also enjoy listening and lecturing about evidence-based clinical knowledge.

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